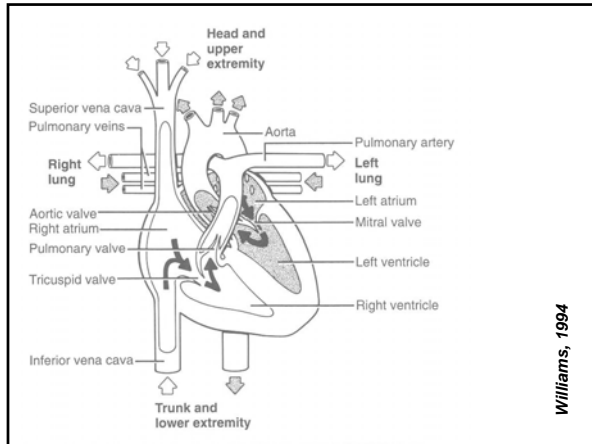
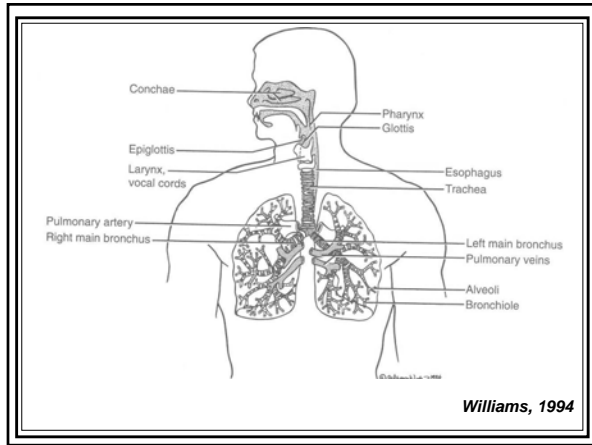


PART I: SCIENTIFIC FOUNDATIONS

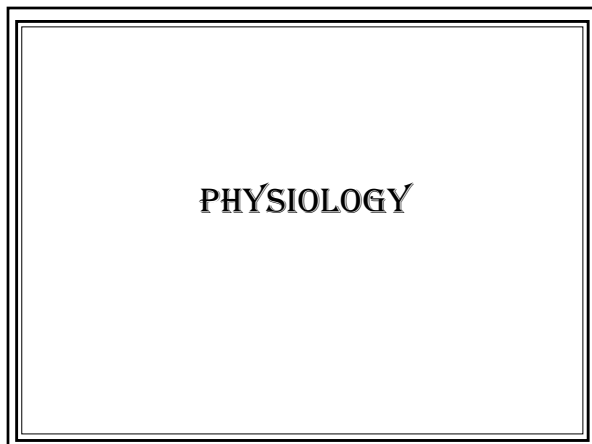
ANATOMY

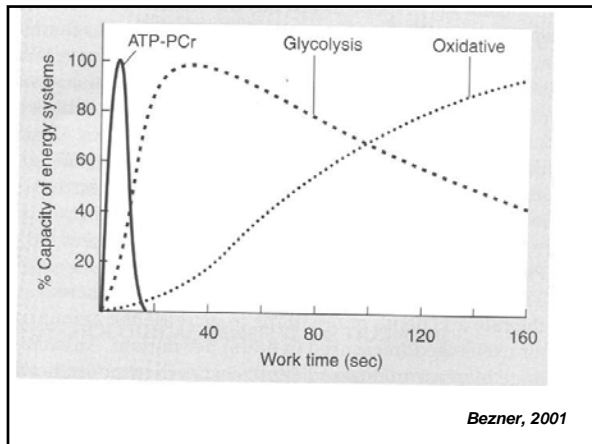


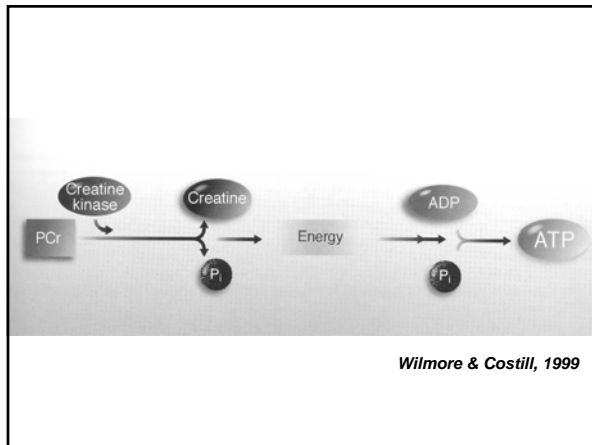
Williams, 1994

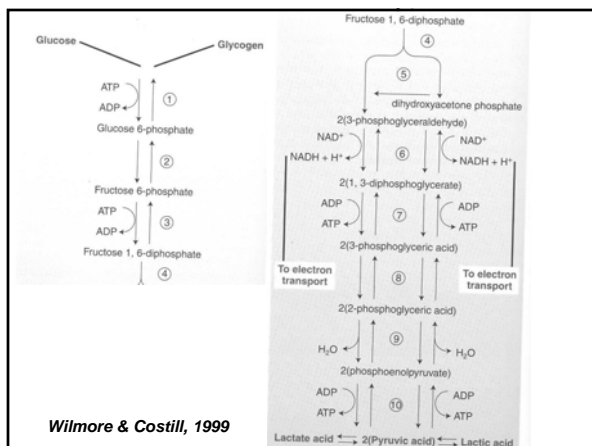


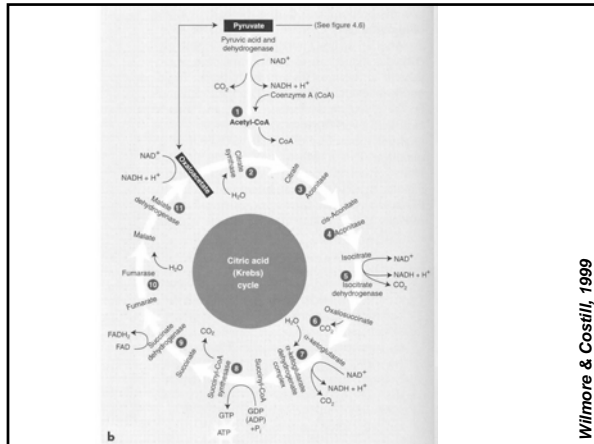
Williams, 1994

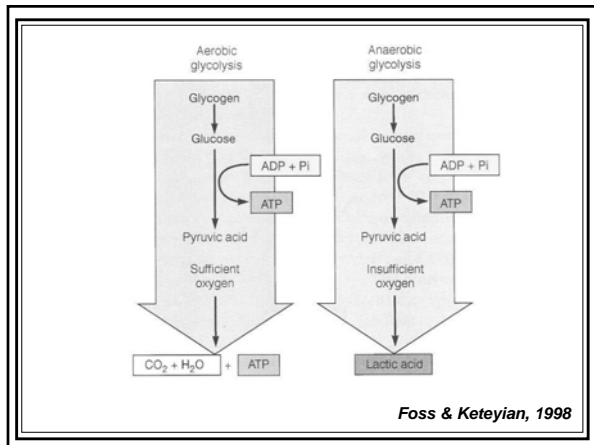


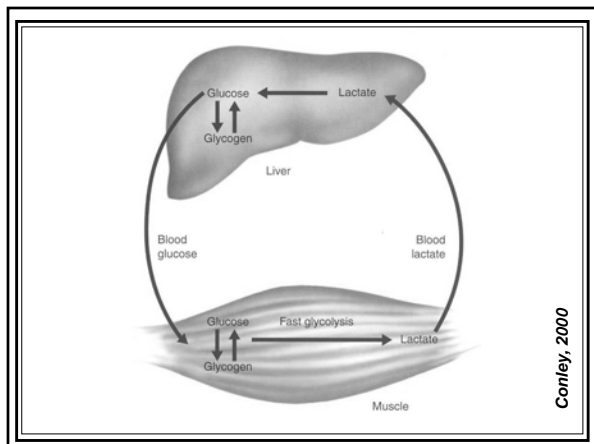


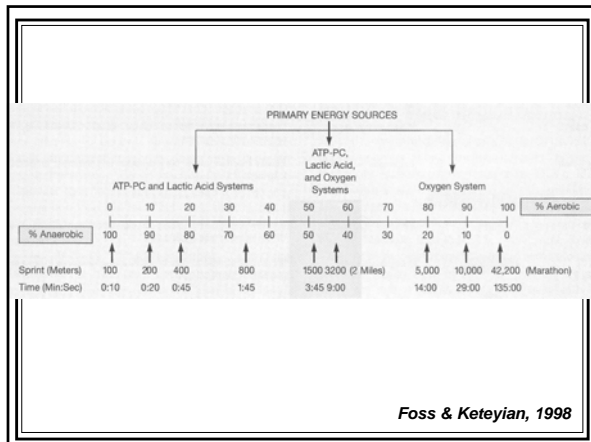












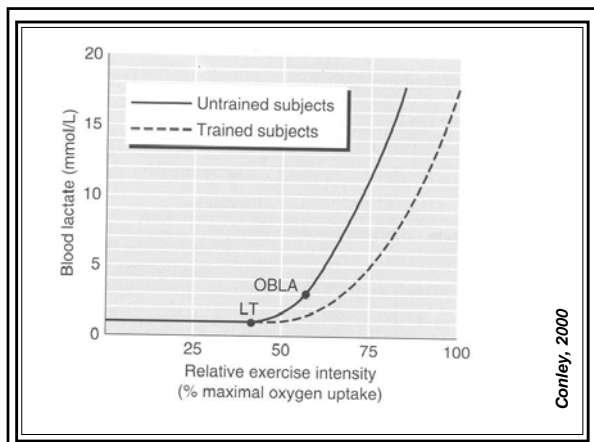
Foss & Keteyian, 1998

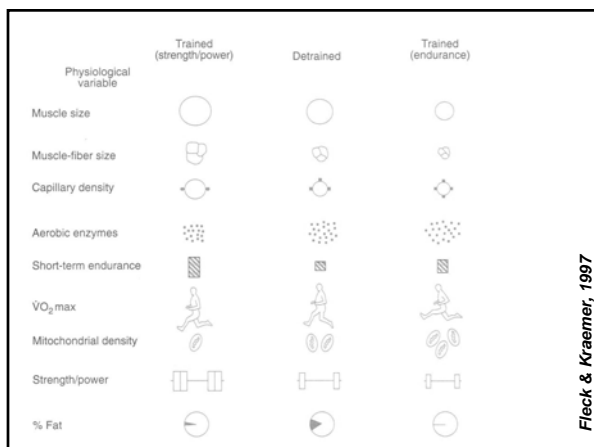
Table 5.7
Contributions of Anaerobic and Aerobic Mechanisms to Maximal Sustained Efforts in Bicycle Ergometry

	0-5 s	30 s	60 s	90 s
Exercise intensity (% of maximum power output)	100	55	35	31
Contribution of anaerobic mechanisms (%)	96	75	50	35
Contribution of aerobic mechanisms (%)	4	25	50	65

Conley, 2000

- Key Responses**
- Heart Rate
 - Stroke Volume
 - Cardiac Output
 - a – vO₂ Difference
 - Blood Flow
 - Blood Pressure
 - Pulmonary Ventilation





PART II: TECHNIQUES

Conditioning Techniques

- Running
- Biking
- Swimming
- UBE
- Slide Board
- Jump Rope
- Others?

Conditioning Techniques

- LSD
- Interval
- Fartlek

PART III: PROGRAM DESIGN

Indications

- Everyone, unless contraindicated

Contraindications

- Pain, discomfort – chest, neck, jaw, arms
- Shortness of breath at rest/mild exertion
- Dizziness or syncope
- Orthopnea / paroxysmal nocturnal dyspnea
- Ankle edema unrelated to injury
- Palpitations or tachycardia
- Intermittent claudication
- Known heart murmur
- Unusual fatigue

ACSM, 2000

Acute Program Variables

- Choice of exercise
- Intensity
- Tempo
- Number of Repetitions
- Number of Sets
- Volume
- Rest Intervals
- Number of Sessions
- Frequency

Choice of Exercise

- Running
- Biking
- Swimming
- UBE
- Slide Board
- Jump Rope
- Others?

Intensity

- 70 – 85% of HR_{max}
- 60-80% of HRR

ACSM, 2000

Intensity

- Age predicted max = $220 - \text{age}$
- Target HR Range =
 $([HR_{max} - HR_{rest}] \times .60 \text{ and } .80) + HR_{rest}$

ACSM, 2000

Duration

- 20-30 minutes?

ACSM, 2000

Rest Intervals (Conley, 2000)

% Max	Energy System	Exercise Time	Work:Rest
90 -100	Phosphagen	5 – 10 s	1:12 – 1:20
75 – 90	Glycolysis	15 -30 s	1:3 – 1:5
30 -75	Glycolysis	1 – 3 min	1:3 – 1:4
20-35	Oxidative	> 3 min	1:1 – 1:3

Frequency

- 3 – 5 times per week?

During a game, a typical NBA player runs 2.1 miles at an average pace of 9 miles per hour. So he should train to run 6:45 miles, right?

A DIFFERENT APPROACH
